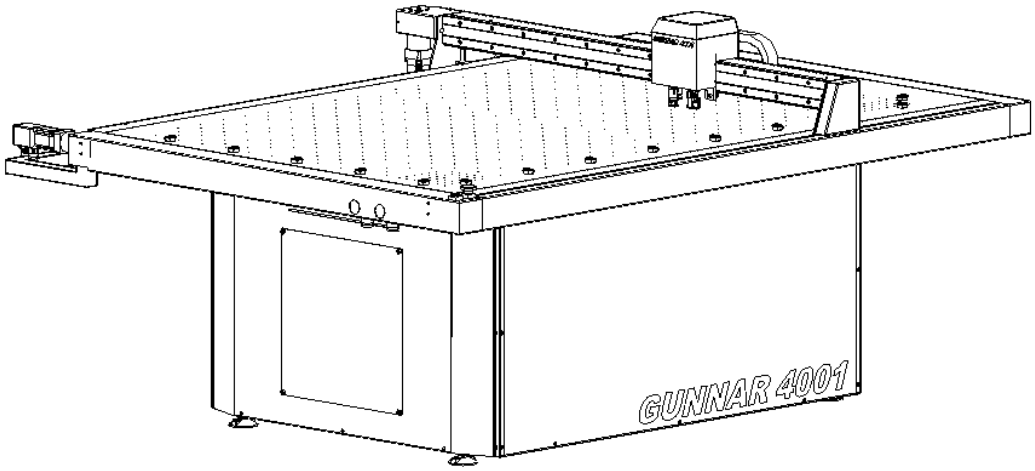
GUNNAR 4001

User Manual

By GUNNAR Weissenberger AG



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Content

General information 5

Introduction 5

Liability 5

Intended purpose 5

Liability 5

Data protection 5

Overview 6

Overview Fig. 01 6

Panel Fig. 02 6

Z – Head Fig. 03 7

Blade head 45° Fig. 04 8

Blade head 90° Fig. 05 8

Controller Fig. 06 9

Technical data 9

Space requirements 9

Measures and weights 10

Electrical connections 10

Three phase installation 10

Connection style and power consumption of vacuum pump. 10

Power supply for electronic 11

Vacuum installation 11

Exhaust 11

PC connection / settings 11

Pneumatic connection 11

Environment 11

Cutting data 12

Supplied with machine 12

Accessories 12

Unpacking 13

Installation preparation 13

Installing the machine 13

Connecting up the 4001 13

First installation of the SPT32 software 14

Update SPT32 Software 14

Operating the GUNNAR 4001 15

First start up SPT32 15
Start up SPT32 15
Switching of the system 15
Insert cardboard 15
Changing blade 16
Machine settings 16
Reading the basic setting 16
Basic settings 16
Compressed air settings 17
Blade depth adjustment 17
Throttle setting 17
Servicing 17
General cleaning 17
General cleaning 17
Cleaning and changing of the air filter 17
Cleaning the table 18
Cleaning the guidance 18
Lubrication 18
Lubricate the guidance 18
Greasing the z head 19
Replacing parts 19
Felt stopper 19
Blade head 19
Sliding part 45° blade head 19
Sliding part 90° blade head 19
Pressure spring 45° blade head 19
Pressure spring 90° blade head 20
Repairs 20
Troubleshooting 20
Errors and removal 20
Status lamp doesn't light 20
Machine does not work – green lamp is on 20
Guarantee 21
Guarantee provisions 21
Index 21
Registry form 22

General information

Introduction

The information contained in this document corresponds to the latest developments at the time of publication. Printing errors and mistakes cannot be excluded

We reserve the right to make design modifications or to depart from designs shown

Liability

Please read the following safety advice before installing, operating, servicing or repairing the machine.

- The installations, servicing and repair of the machine should be carried out solely by a **GUNNAR trained service engineer**.
- Care should be taken to observe the technical data for the machine and in particular the ambient conditions.
- **Only trained personal** is allowed to operate the machine. Your GUNNAR distributor will provide training.
- Any unauthorized modification or opening of the controller will automatically render the product guarantee and the safety guarantee invalid.
- Contact your GUNNAR representative prior to installing accessories
- For security the machine must be operated **exclusively by one person**.
- For safety reasons always one person must be at the machine.

Intended purpose

The 4001 has been designed exclusively for cutting cardboard for mounts. Only tool heads developed by GUNNAR can extend these purposes.

Liability

Weissenberger AG will not assume any product liability in the event of incorrect handling or use of the Software, the machine or machine components. Weissenberger AG is additionally not responsible for any loss of data. We recommend that data be backed up on a regular basis.

Data protection

Weissenberger AG holds all the rights. Neither the machine data nor any of the Software may be made available to third parties.

Overview

Overview Fig. 01

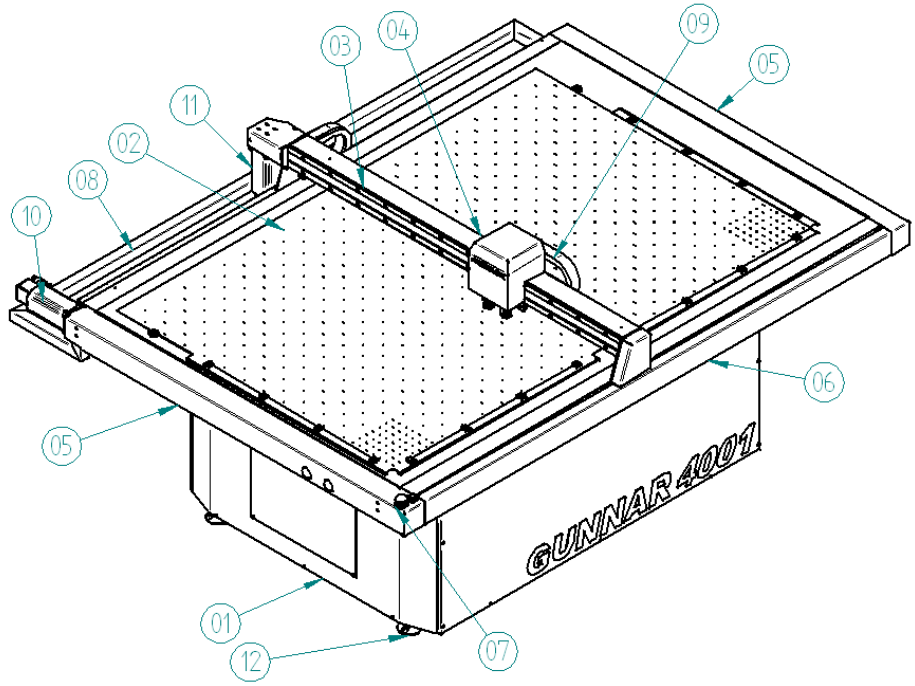


Fig. 1 Overview

01	Stand	07	Panel
02	Vacuum table	08	Frame
03	Y Arm	09	Cable chain
04	Z Head	10	X Motor
05	Side cover	11	Y Motor
06	Front cover	12	Feets

Panel Fig. 02

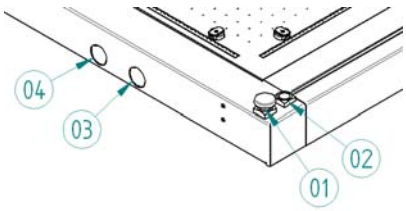


Fig. 2 Panel

01	Emergency stop	300091
02	Start button	300093
03	Pressure reduction Clamps	104216
04	Pressure reduction Z Head	104216

Z – Head Fig. 03

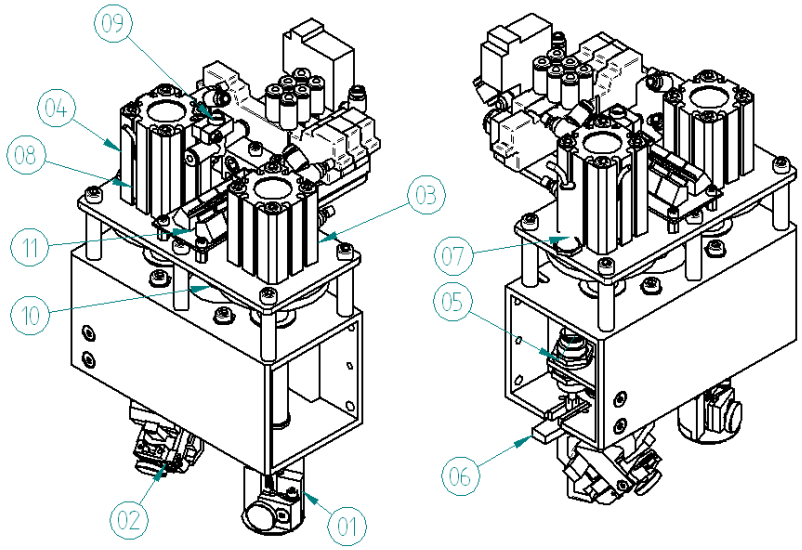


Fig. 3 Z-Head

01	Blade head 90°	300043
02	Blade head 45°	300042
03	Cylinder for 90°	SMC_CQSB_20_25D
04	Cylinder for 45°	SMC_CDQSB_20_25D
05	Cylinder for dynamic blade depth	SMC_CJPB10_15
06	Dynamic blade depth	300087
07	Z Index sensor	ZJ1,5-M8EB-DPO-X0409
08	Cylinder pos. sensor	SMC_D-A93
09	Throttle	SMC_AS1201F-M5-04
10	Z Motor	VRDM366-50LHA
11	Connector board	300116

Blade head 45° Fig. 04

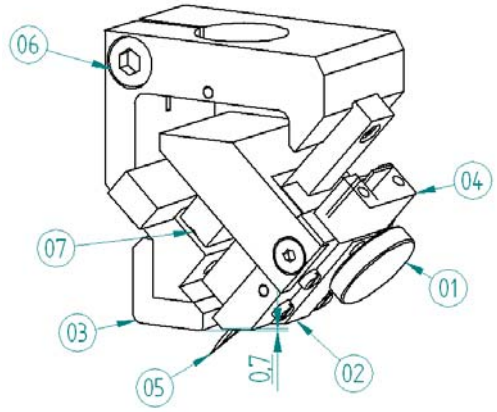


Fig. 4 Blade head 45°

01	Knurled screw	100058
02	Clamping part	300015
03	Sliding part	300011
04	Blade holder	100086
05	Blade thin	001012 / 001013
06	Locking screw	Zylinderschraube M5 x 16
07	Pressure spring	Feder 44_2_3

Blade head 90° Fig. 05

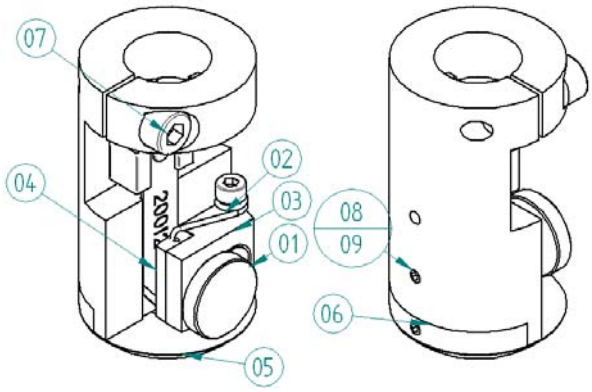


Fig. 5 Blade head 90°

01	Knurled screw	300023
02	Spring	300128
03	Clamping arm	300013
04	Clamping plate	300014
05	Sliding part 90°	300012
06	Sliding part holder 90°	300114
07	Locking screw	Zylinderschraube M5 x 16
08	Set screw	M3 x 4
09	Sliding part axis	300115

Controller Fig. 06

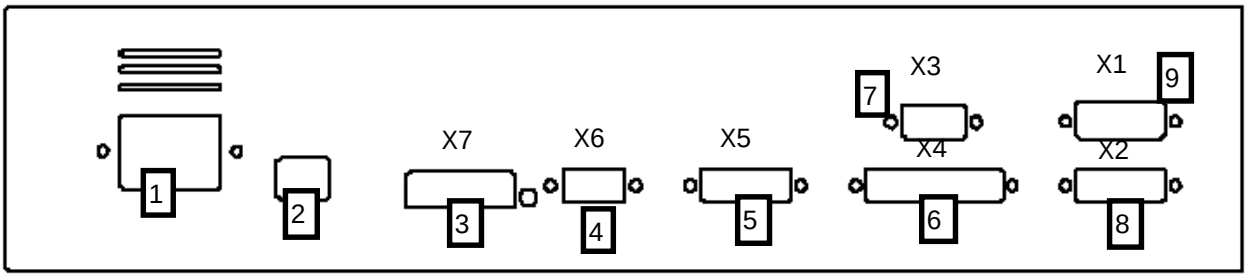


Fig. 6 Controller

1. Power plug
2. Power supply selection switch
3. X7 = Motor Z-Achse
4. X6 = Reserve
5. X5 = Z-head
6. X4 = Signal stand / Printhead
7. X3 = Comport – PC RS232
8. X2 = Y-Axis
9. X1 = X-Axis

Technical data

Space requirements

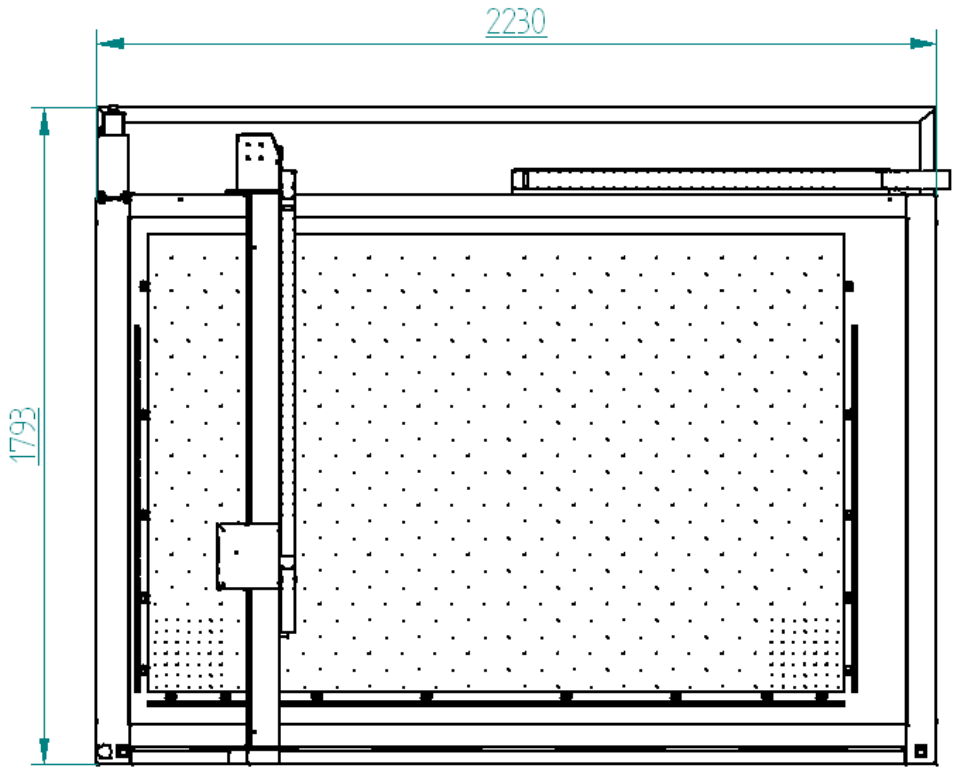


Fig. 7 Space requirements

Measures and weights

	GUNNAR 4001 XL
Max. Matboard size	2 pieces 950 x 1250 mm (COE) 37.40 x 49.21“ or 1900 x 1250 mm 47.80 x 49.21“
Max. outside cut	1900 x 1230 mm 47.80 x 48.03“
Dimensions L/W/H	2293 / 1793 / 1108 mm 90.28 / 70.59 / 43.62
Weight	250 Kg 550 lbs

Electrical connections

The GUNNAR 4001 requires a flawless electrical installation with an earth connection (GND) and 115V or 230V between phase and neutral before it can be connected. Please review the electrical diagram below.

WARNUNG: The GUNNAR 4001 is setup for 115 or 230V before delivering. Please check the voltage setup of the controller and the connection style of the vacuum pump before connecting the machine to power supply.

Power consumption without vacuum pump
115 V = 4A
230 V = 2A

Three phase installation

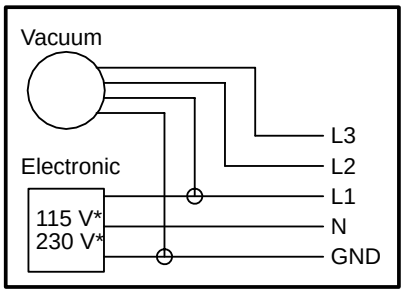


Fig. 8 Three phase installation

Connection style and power consumption of vacuum pump.

Voltage (Between the Phases)	Frequency	Pump number	Connection style	Power consumption
345 – 415 V	50 Hz	2BH16007AH26	Wye connection	7.2 A
200 – 240 V	50 Hz	2BH16007AH26	Delta connection	12.5 A
345 - 415 V	60 Hz	2BH16007AH21	Wye connection	7.3 A
200 - 240 V	60 Hz	2BH16007AH21	Delta connection	12.6 A

Please review the connection manual delivered with the vacuum pump.
If the voltage is out of this range please contact your GUNNAR support.

Power supply for electronic

NB: The power level must not fall short at any circumstances (not even short terms).

Power supply voltage 230V +/- 13%
115V +/- 13%

(See also chapter „Connecting up the 4001 “, page 13)

Vacuum installation

Exhaust

The exhausted air has to be leaded out of the machine cabinet.
Like to enlarge the exhaust hose you have to increase the diameter of the exhaust hose to min. 2”. On this type a maximum length of 10 m (33 feet) is allowed. The exhaust hose has to be laid out as flat and straight as possible. Please make sure there are no sharp inflections.

Please note: The shorter and straighter the exhaust hose as better the vacuum suction

PC connection / settings

Connect the delivered RS232 cable to COM1 if possible.
The PC needs at least one free COM port with FIFO UART 16550.

	Basic configuration	**Recommended configuration**
System Software	Windows XP or Vista	Windows XP or Vista
GHz	Read basic configuration for system software	2 GHz
Ram	Read basic configuration for system software	1 GB
Graphic card	Read basic configuration for system software	Separate graphic card 128 MB Ram
Software (included on disc)	SPT32 DotNet Framework 2.0	SPT32 DotNet Framework 2.0
Screen Resolution	1024 x 768 Pixel	1024 x 768 Pixel
CD Rom drive	4 x CD drive	16 x CD/DVD drive

Pneumatic connection

Min. line pressure 6 bar (90psi)
Max. Compressed air consumption 40L / min

Dry compressed air is recomendet. Otherwise you are damaging the valves and the cylinders. In case of doubt please use a water separator!

Environment

Ambient temperature 10 - 35 °C / 50 - 95 °F
Relative humidity 30 - 70 %
The GUNNAR 4001 must be kept clean and free of dust.

NB: The machine must be free of water contact. Furthermore, no explosive dust-air or gas – air mixture is allowed to reach the machine

Cutting data

Max. Cutting speed servo motors	1500 mm (60 Inch) / second
Max. Cutting acceleration	6 m/s^2
Max. Cutting speed micro stepper motors	1000 mm (40 Inch) / second
Max. Cutting acceleration	4 m/s^2
Max. Empty drive speed servo motors	2000 mm (80 Inch) / second
Max. Empty acceleration	8 m/s^2
Max. Empty drive speed micro stepper motors	1000 mm (40 Inch) / second
Max. Empty acceleration	4 m/s^2
Max. Cut able mat thickness	3.5 mm (0.14 Inch)
Min. cutting radius*	0.5 cm (0.2 Inch)

*This is the minimum radius the machine is able to cut. But the constitution of the mat board and the condition of the blade influences the quality of the cutting as well as the perfect machine adjustment.

NB: With thick or special hard mat boards you have to decrease the cutting speed

Supplied with machine

Article	**Number**
User manual	
Vacuum manual	
Allen key 1.3 mm	
Allen key 2 mm	
Allen key 4 mm	
Allen key 5 mm	
10 Blade holder	100086
2 felt underlay sheets	401030 (Only machine with vacuum table)
200 Blade 20012 thin	20012
1,5 m exhausting hose	300140
Data cable RS232 link 3m	11.01.9030
4 Rubber buffer for machine feet	300109
Configuration disk	
1 Installation CD	
Test mat	

Accessories

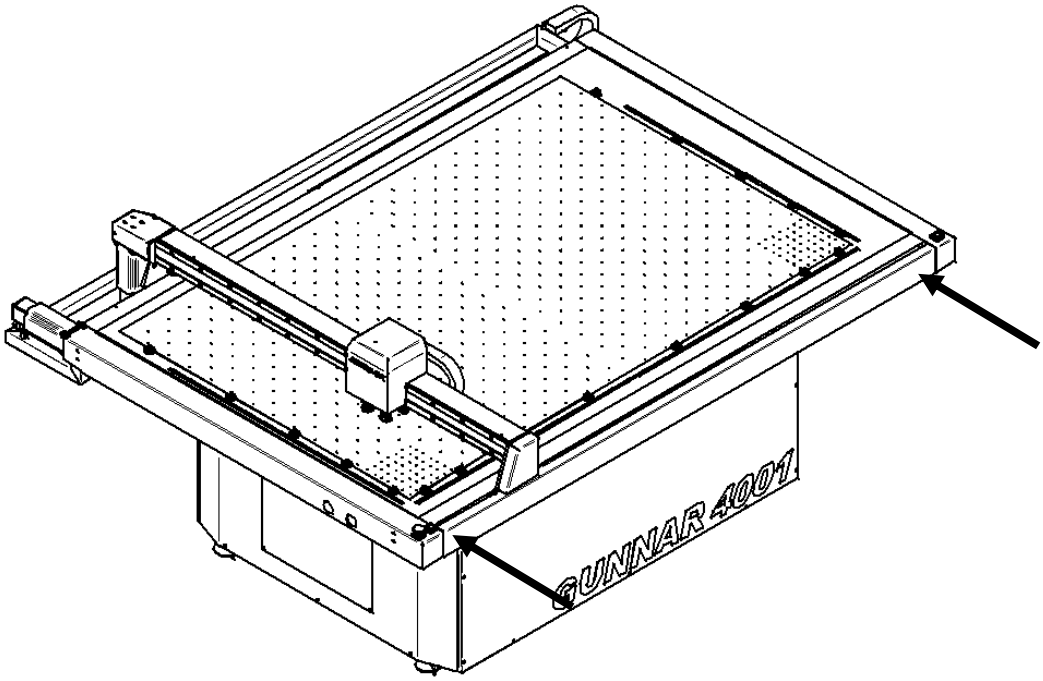
The following accessories are available at extra costs.

Article	**Number**
Blade for hard matboard	001012
Blade for soft matboard	001013
Underlay sheets cardboard for vacuum	
Underlay sheets felt for vacuum	401030

Further information is available from your GUNNAR dealer or from internet under,
www.gunnar-europe.com

Unpacking

1. Open the machine packaging and remove the box with accessories
2. Check the scope of delivery
3. Lift up the box from palette
4. Remove the screws which fixes the machine onto the palette
5. Lift the 4001 directly to the cleaned mounting device (ONLY LIFT THE MACHINE ON FRAME, MACHINE BASE AND THE MARKED POSITIONS)



6. The original packaging should be kept for the duration of the guarantee period.

Installation preparation

In order to guarantee the best quality, make sure the machine will be place on an even and strong (preferably concrete) ground

1. Clean the ground carefully.
2. Adjust the machine exactly so as you would like to work with it.
3. Mark through the holes in the feet ("Fig. 1 Overview" No. 12) the exact position for the bracing screws.
4. Put down intended position an anchor or dowels at all 4 feet.
5. Screw together the machine with the underground solidly
6. Check now whether the machine has a strong stand and test with help of an air leveler the machine is absolutely even put.

NB: The niveau of the machine could be changed also when the feets are already fixed on the ground. You only need to release the nut.

Installing the machine

NB: All electric and pneumatic setup are only allowed to be done by trained experts

Connecting up the 4001

1. Connect the compressed air to the Ø8 mm connection sleeve. The consumption and the necessary pressure are specified in the technical data.

NB: Befor working on the controller, the main cable must tbe first be unplugged in order to avoid electrical shocks.

2. Check the power supply as shown in the attachement.
3. Check the main voltage. If the main voltage switch is not already set to the standard voltage for your country, then you must change this now.
4. Check the voltage settings of the machine. If the voltage setting of controller and vacuum pump is not on your country setting please do so.

NB: The voltage of a stepper controller WDM could be changed with switches. Servo controller LXM are setup for 115 or 230V if there is a different voltage you have to change the connection.

NB: If the input voltage is incorrectly set, this can destroy the controller. Such damage is not covered by the guarantee.

5. Connect up the main voltage using the main cable, article No. 12.03.6510, which is supplied (the plug required for your country must be affixed by a suitably qualified person).

Cable colours are as follow:
- Yellow/Green: Ground
- Blue: Neutral
- Black, Grey, Brown: Phase 1, Phase 2, Phase 3

Ground and neutral ALWAYS have these colors. The color of the phases can be changed.

6. Connect the data cable RS232 Art. Nr. 11.01.9030. Connect the plug "X3" at the controller with the COM port at the PC (prefer COM1)

First installation of the SPT32 software

1. Start your PC
2. Insert the SPT32 installation CD ROM.
3. If the CD doesn't start by it self follow these steps
    a. Press start
    b. Run
    c. Type in A:\setup (A is the name of your CD ROM drive)
    d. Press Enter
4. Follow the instructions in the setup program
5. Please configure Windows see "CHAPTER PC connection / settings", Page 11

Update SPT32 Software

1. Start your PC
2. Insert SPT 32 installation disc1 into CD ROM drive
3. If the CD doesn't start by it self follow these steps
    a. Press **Start** button
    b. Run
    c. Type A:\setup (A is the name of your CD ROM drive)
    d. **Enter**
4. Follow the instructions on screen
5. **The SPT32 readme.txt file in the "SPT32" directory contains special instructions. This informative text file must be read once the installation is complete**

Operating the GUNNAR 4001

First start up SPT32

NB: The first start up must be done by a GUNNAR technician to check the machine settings.

To start SPT32 please do as follow:

1. Start your PC
2. Wait till the operating system is started
3. Start the GUNNAR 4001 by turning the main switch / emergency stop clockwise to get loose
4. Click on the start button on your PC
5. Open programs
6. SPT32 (program group)
7. SPT32 (icon)
8. When the machine is started up start the vacuum pump shortly by clicking the clamping button in SPT32.
9. Now you can check the rotation direction of the vacuum pump with the arrow on the pump cover or by holding a hand in front of the exhaust pipe.
10. If the pump rotates in the wrong direction or sucks air through the exhaust pipe you have to change two phases.

NB:

Unplug the main plug of the machine before changing the phases.

Never change a phase with the neutral or the ground. DANGER OF LIVE and you will damage the machine.

Start up SPT32

To start SPT32 please do as follow:

1. Start your PC
2. Wait till the operating system is started
3. Start the GUNNAR 4001 by turning the main switch / emergency stop clockwise to get loose
4. Click on the start button on your PC
5. Open programs
6. SPT32 (program group)
7. SPT32 (icon)

For the operation and registration please read the SPT32 Help. The help could be started by pressing the F1 button on your keyboard.

Switching of the system

To switch of the machine please follow these steps:

1. Close SPT32 by pressing “Alt” + “F4” or in the menu, end. 🖫"SPT32 help, chapter switching off".
2. Switch off your GUNNAR 4001 by pressing the main switch / emergency stop (“Fig. 2 Panel” No. 01)
3. Now stop windows
4. Switch off the PC. Newer PC’s may switch off automatically or be left on.
5. If the 4001 is not being used for a considerable period of time, then the compressed air should similarly be switched off and machine covered.

Insert cardboard

To cut a cardboard you have to use underlay sheets. The most suitable underlay sheets you can order at your GUNNAR dealer

NB: If using a vacuum table only porous underlay sheets are suitable. Only these make vacuum possible to suck in the cardboard.

The cardboard to be cut can not be strongly waved. Otherwise the vacuum is not able to hold the cardboard. If the vacuum does not such the cardboard completely, do as follow

1. Press the “F3” to start the vacuum.
2. Smooth the cardboard flat with your hand
3. If the carboard is held completely now by the vacuum, you can start the cut with “CTRL” + “F9”

Maximum cardboard thickness that can be cut is 3.5 mm (0.14’’)

Changing blade

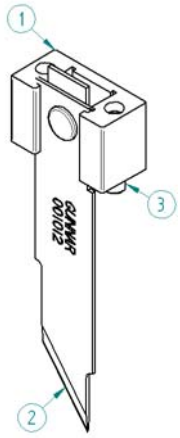


Fig. 9 Blade holder

When SPT32 is running press “CTRL” + “F5” to bring the bladheads into the blade change position. Now the knurled screws (“**Fehler! Verweisquelle konnte nicht gefunden werden.**” No. 01 and “**Fehler! Verweisquelle konnte nicht gefunden werden.**” No. 01) can be turned anti clockwise to release the blade. Then the blade can be easy lifted out of the blade head.
Press on the **tongue** (“Fig. 9 Blade holder” No.01) on the blade holder, pull the blade out of the blade holder and insert a new one.
Make sure that the blade holder will be pushed down when you insert the blade, then tighten the clamping screw solidly.

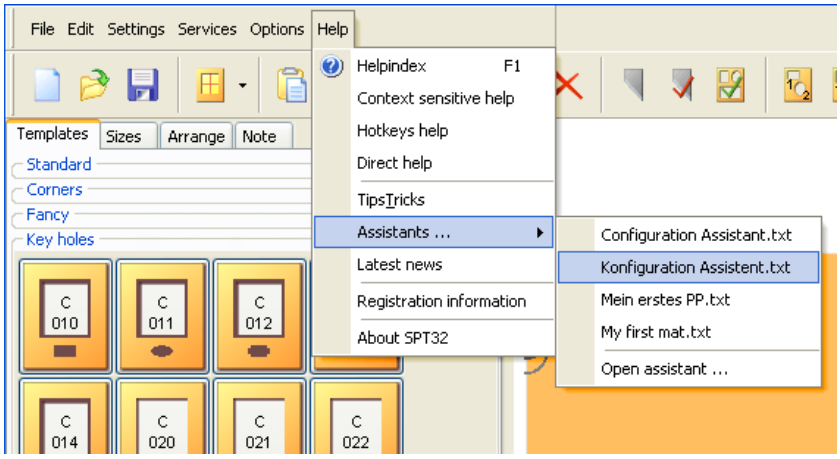
Machine settings

Reading the basic setting

The software settings are supplied with the GUNNAR4001 on the “configuration” disc. Instructions may be found in chapter “First installation of the SPT32 software” page 14.

Basic settings

Detailed instructions for the basic settings are given in the help program. See “First start up SPT32” or setup assistant.



Compressed air settings

The pressure for the blade head is adjustable with pressure reduction (“Fig. 2 Panel” No.03). Basic setting is 3.5 bars. If there are pressure marks in the mat board after cutting the pressure could be reduced to minimum 2.5 bars. If does not fully cut hard or thick mat boards the pressure could be increased up to maximum 5 bars.
If clamps are leaving pressure marks in the mat board the pressure of them could also be decreased with pressure reduction (“Fig. 2 Panel” No.04) to min. 3bars. Maximum pressure for clamps is also 5 bars.

Blade depth adjustment

The blade depth must be set so that the **backing material is cut into** by **0.3 up to 0.5 mm**. To adjust the blade depths follow these instructions.

1. **Make sure that the initial blade depth is not set too deep (turn set screw on holder in for a shallower cut) for the first cut. This will avoid damaging the table top.**
2. Cut a rectangle
3. Check the depth of the cut in the underlay sheet.
4. If the cut is too deep, use the 1.3 mm hexagon socket screw key supplied in your installation kit to adjust the blade holder. Turn the screw on holder in (clockwise) for a shallower cut. If the cut is not deep enough, then unscrew the screw (anti-clockwise). One turn is an app. 0.4 mm (0.015 Inch) dept.
5. Repeat steps 2 to 4 until the cut is some 0.3 to 0.5mm deep.
6. It is customary to set up different blade holder for various cardboard thicknesses you may be cutting.

Throttle setting

In the case of circles and other shapes, where the blade cannot be inserted in a corner but only in a curve, use is made of the throttle. This ensures that the blade is inserted more slowly and does not leave any insertion marks on the mount. Further information on this setting may be found in ✍"SPT32 Help, Chapter Throttle".

Servicing

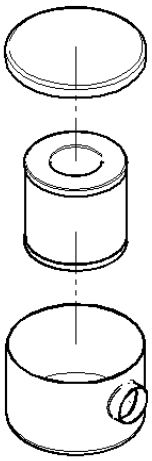
General cleaning

NB: All cleaning and maintenance work must be cunducted with the machine switched off and the main plug pulled out. Just dry cleaning is allowed on the machine

General cleaning

Cleaning the GUNNAR 4001 is an essential part of servicing. The cleaner it is kept, the longer its service life will be. The GUNNAR 4001 should always be kept dust-free and free from bits of cardboard and fibers. This is best done by sucking up the dust. Dust should only be **blown out** when cleaning the **guides**. Please read the following chapter.

Cleaning and changing of the air filter



1. Air filter cover
2. Air filter
3. Air filter box

The air filter should be cleaned approximately all 100 running hours. To clean the filter, please follow these steps:

1. Switch off the machine and pull out the mail plug
2. Open the right service cover of the stand
3. Release the clamps of the air filter cover
4. Remove the cover and take out the filter carefully. Make sure there is nothing falling into the vacuum pump. Dust or other particle will destroy the vacuum pump

NB: Any impurities in the suction pipe can lead to the destruction of the vacuum pump

5. Shake the impurities as good as possible out of the air filter. Then blow out the filter from the inside to the outside with compressed air.
6. With a vacuum cleaner you can clean the air filter box.
7. Put the air filter centric back into the air filter box
8. Fix the air filter cover with the clamps
9. Replace the service cover again
10. Connect the main plug

Cleaning the table

The table top can additionally be cleaned with a glass cleaning agent or detergent.
Don't use any solvents.

Cleaning the guidance

For defending the guidance of rust they should only be cleaned by compressed air. If the dust could not be blown away please clean and grease the guidance. (Chapter "Lubricate the guidance" page 18)

Lubrication

Lubricate the guidance

The guidance in X and Y must be lubricated all 400'000 cuts or when the lubrication is wiped off the guidance. If the environment is very dusty you have to lubricate the machine earlier. To lubricate the guidance follow these steps:

1. Remove the start and emergency stop buttons from the blue side cover
2. Remove the covers.
3. Move the Z head to upper left corner of the machine
4. Cover the table to hold cleaning and lubrication away

NB: Watch the security guidance on cleaner and grease.

5. Clean all guidance in X and Y (we recommend Loctite 7036 fast cleaner to remove the old grease from guidance)
6. Dry the guidance

NB: Only Syntheso W is provided by GUNNAR. Wrong grease can decrease the livetime of the guidances

7. Spray a clean film of Syntheso W on the guidance.

NB: Keep the Syntheso W shaking before and between every spray. This is the only way to keep the guidance perfect.

8. The rolls also must be lubricated.

NB: Move the Y arm / Z head during the spraying on the rolls. Doing this keeps the rolls are lubricated completely.

9. Move Z head and Y arm a little to spray on the part of guidance which was covered by the carriages.
10. Wait at least 30 minutes to let the lubrication dry.

Greasing the z head

The bearing bushes, that are used for the leadership of the cylinder-shafts, must be lubricated intermittently all 15'000 cuts.

1. Remove the head cover
2. Clean the Shafts
3. Lubricate them slightly (we recommend Moykote DX)
4. Move the heads up and down by hand
5. Remount the head cover

Replacing parts

NB: All cleaning and maintenance work must be conductet with the machine switched off and the main plug pulled out

Felt stopper

If the felt stoppers are worn out do the following to change them:

1. Remove the old felt stopper.
2. Clean the table with pure gas. ATTENTION: Never use solvent. This can damage the lacquer of the table.
3. Plug in the machine and start SPT32.
4. Put an absolute rectangular cardboard onto the clamps
5. Press the F3 key to start the vacuum and clamp the cardboard.
6. Glue the new felt stopper exactly onto the edges of the cardboard.

Blade head

1. Shut the Machine off.
2. Turn the blade head and Undo the locking screw with the 4 mm hexagon socket screw key (Fig.04. Nr.07 or Fig.05. Nr.07).
3. Pull the blade head down and insert the new one.
4. Tighten the locking screw again.

NB: Replacing the blade head can alter the boarder and opening dimensions on the mount. Check these dimensions and adjust them if necessary.

Sliding part 45° blade head

If the sliding part attains its **minimum thickness** of **4.4 mm** at the base, then it must be replaced as follows.

1. Remove the blade head as described in ✍ "Chapter, Blade head".
2. Undo the screw located in the sliding part (Fig.04. Nr.03)
3. Remove the sliding part and screw on the new one.
4. At the 45° bladehead adjust the bit stop screw to 0.7mm (Abb.04)
5. Attach the blade head again.

NB: Replacing the blade head can alter the boarder and opening dimensions on the mount. Check these dimensions and adjust them if necessary.

Sliding part 90° blade head

If the sliding part attains its **minimum thickness** of **2.2 mm**, then it must be replaced as follows.

1. Remove the blade head as described in ✍ "Chapter, Blade head".
2. Undo the 2 screws which hold sliding part onto the sliding part holder (Fig.05. Nr.06)
3. Remove the sliding part and screw on the new one.
4. At the 90° blade head is no adjustment necessary after the replacement.
5. Attach the blade head again.

Pressure spring 45° blade head

The pressure spring (Fig.04. No.03) is a part subject to wear. If it breaks, then it must be replaced. The procedure for replacing it is as follows

1. Remove the blade head as in ✍ "Chapter, Blade head"

2. Pull out the broken spring and insert a new one. Take care to ensure that the spring is located in the recess provided for it.
3. Attach the blade head again as in ✍ "Chapter, Blade head"

Pressure spring 90° blade head

The pressure spring is a part subject to wear. If it breaks, then it must be replaced. The procedure for replacing it is as follows

1. Remove the blade head as in ✍ "Chapter, Blade head"
2. Loose the setscrew (Fig.04. Nr.03) and pull out the sliding part axis (Fig.04. Nr.03) .
3. Pull out the broken spring and insert a new one.
4. Replace the set screw so again that the sliding part axis itself can move in the pretended lifting .
5. Attach the blade head again as in ✍ "Chapter, Blade head"

Repairs

Most repairs can be performed by the customer, simply by replacing parts. If a service or a major repair is necessary, then this must be performed by a specialist. Contact your authorized GUNNAR dealer.

Troubleshooting

Errors and removal

Status lamp doesn't light

If the status lamp (Abb.04. Nr.03) does not light do the following:

- Check the power supply at the plug and the controller
- Is the main switch on?
- Is the emergency stop off?

Machine does not work – green lamp is on

- Check the connection of the data cable from PC to machine.
- Switch off the machine and close SPT32 again.
- Switch on machine and wait until the controller has booted (Beeping noise), then start SPT32 again.

Guarantee

Guarantee provisions

The guarantee on the GUNNAR 4001 runs for two year as of the date of delivery or for a maximum of 800.000 mount cuts (holes). The guarantee covers defects due to material faults or production errors. Damage due to negligent and incorrect handling is not covered by the guarantee. Normal wear is similarly excluded from the guarantee (assessment by us). Kindly observe our general terms and conditions in this respect. Within the guarantee period, repairs will be carried out at our expense, following prior agreement with us.

Index

Registry form

GUNNAR - 4001

Machine No.:

Controller No.:

Company name:

Contact Person:

Street:

City:

Zip code:

Country:

Fax - No.:

Email Address:

Key number:

(You will get this number during the first start of SPT32)

Please mail of fax this form to:

Weissenberger AG
GUNNAR
Staatsstrasse 119
CH-9445 Rebstein
SWITZERLAND

Fax: +41 71 775 82 29